CHAPTER 2

DESCRIPTION OF THE OBION RIVER (NORTH FORK) WATERSHED

2.1. BACKGROUND. Obion is thought to be a Chickasaw Indian name meaning "river of many forks". The Obion River system is the primary surface water drainage system of northwest Tennessee and is comprised of four major forks, the North Fork, Middle Fork, South Fork and Rutherford Fork, that flow as separate streams for the majority of their lengths. The confluences of these forks are only a few miles above the mouth of the Obion's discharge into the Mississippi River.

This Chapter describes the location and characteristics of the Tennessee Portion of the Obion River (North Fork) Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Tennessee portion of the Obion River (North Fork) Watershed is located in West Tennessee and includes parts of Dyer, Gibson, Henry, Lake, Lauderdale, Obion, and Weakley Counties.

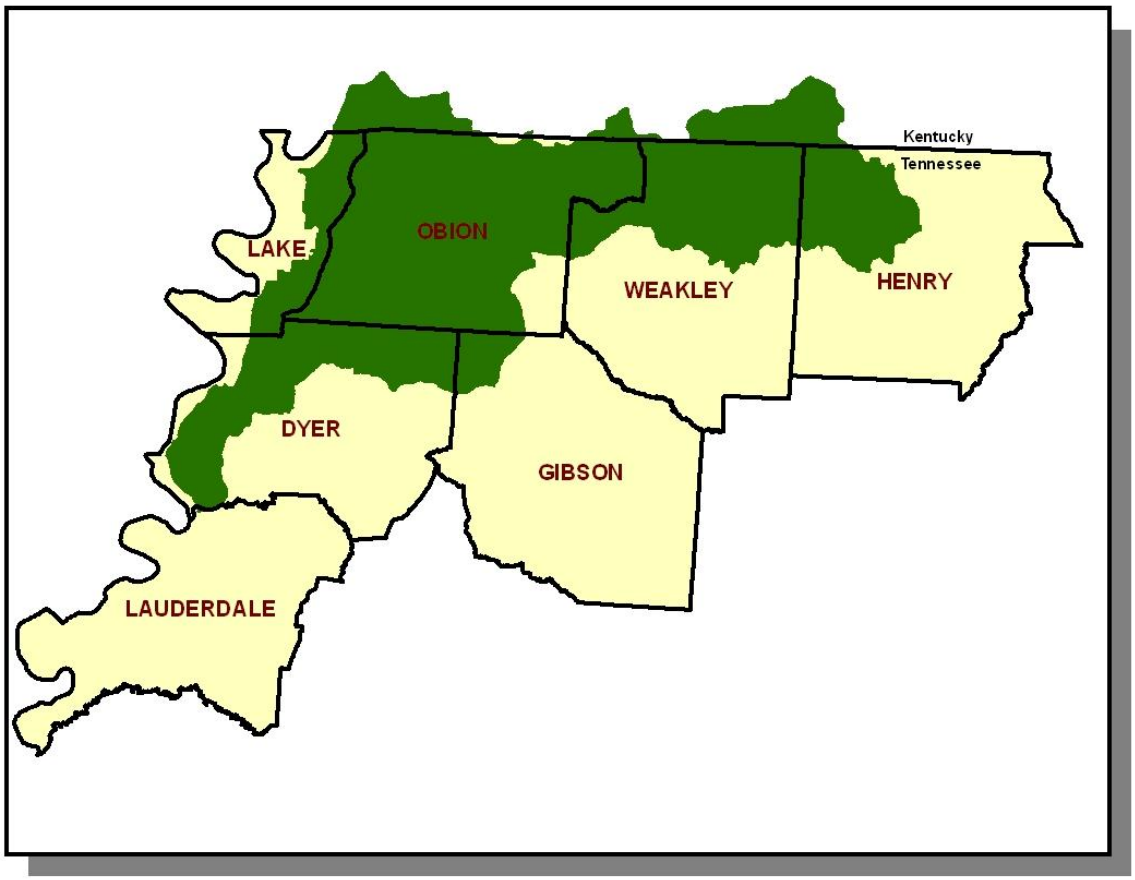

Figure 2-1. General Location of the Obion River (North Fork) Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Obion	43.74
Weakley	18.88
Dyer	17.58
Henry	10.21
Lake	6.74
Gibson	2.73
Lauderdale	0.08

Table 2-1. The Tennessee Portion of the Obion River (North Fork) Watershed Includes Parts of Seven West Tennessee Counties.

2.2.B. Population Density Centers. Twenty-eight highways serve the major communities in the Tennessee Portion of the Obion River (North Fork) Watershed.

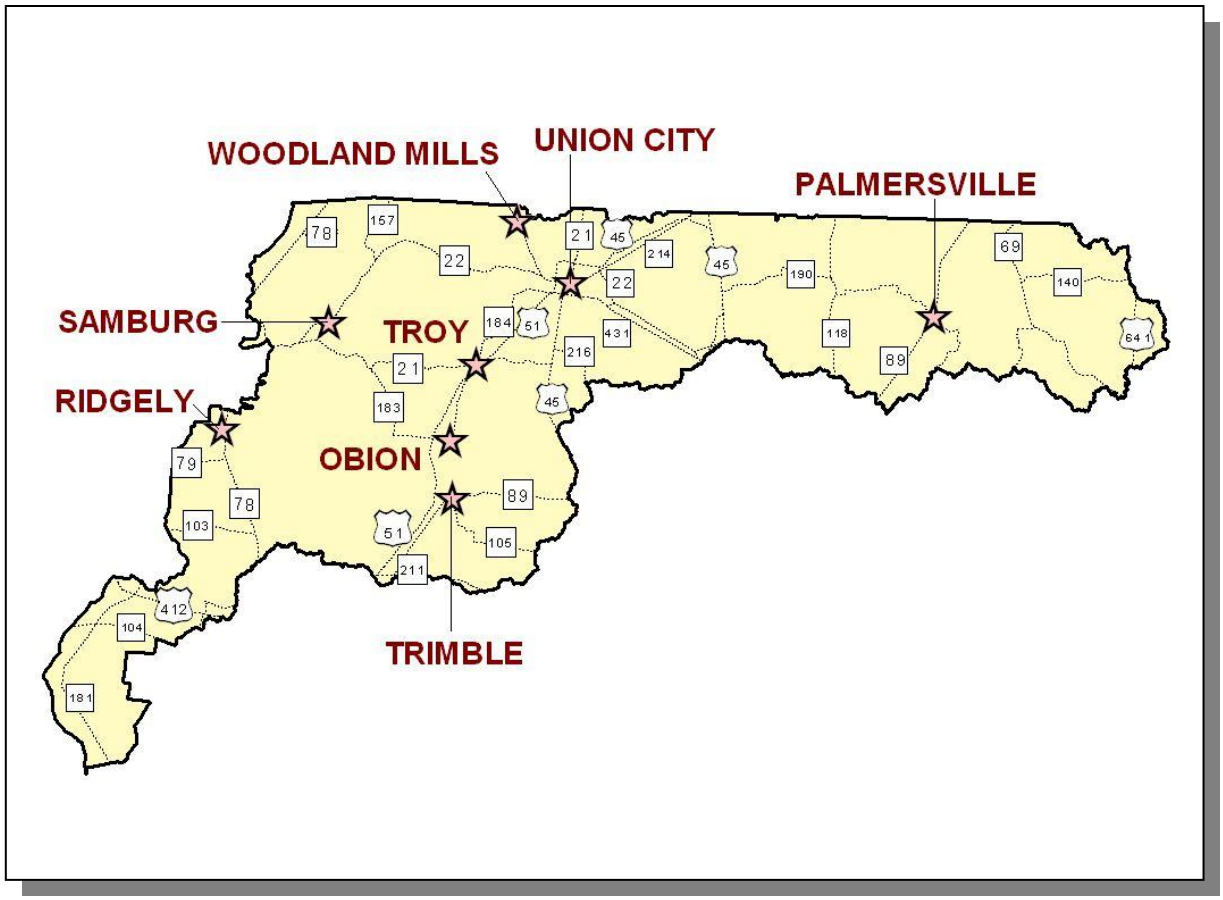

Figure 2-2. Communities and Roads in the Tennessee Portion of the Obion River (North Fork) Watershed.

MUNICIPALITY	POPULATION	COUNTY
Union City*	10,876	Obion
Ridgely	1,667	Lake
Troy	1,273	Obion
Obion	1,134	Obion
Palmersville	927	Weakley
Trimble	728	Dyer, Obion
Woodland Mills	385	Obion
Samburg	260	Obion

Table 2-2. Municipalities in the Tennessee Portion of the Obion River (North Fork) Watershed. *Population based on 2000 census (Tennessee Blue Book) or http://www.hometownlocator.com. Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Tennessee Portion of the Obion River (North Fork) Watershed, designated 08010202 by the USGS, is approximately 1,313 square miles (1,169 square miles in Tennessee) and drains to the Obion River.

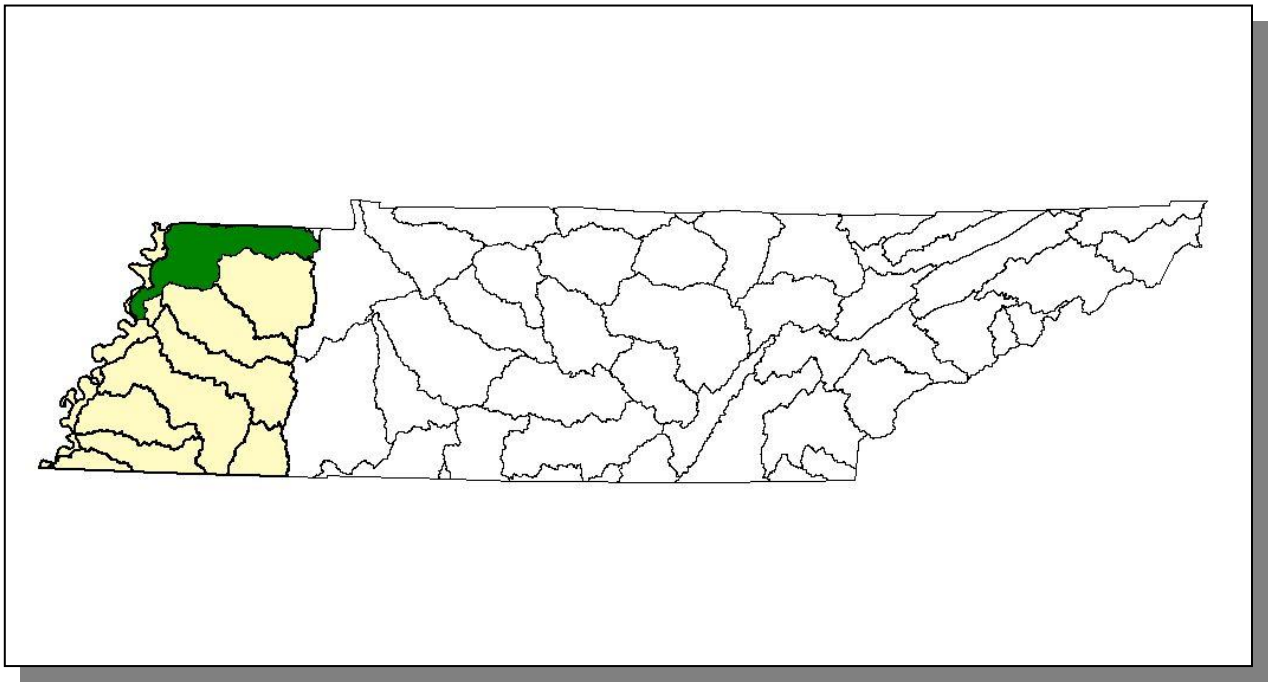

Figure 2-3. The Tennessee Portion of the Obion River (North Fork) Watershed is Part of the Mississippi River Basin.

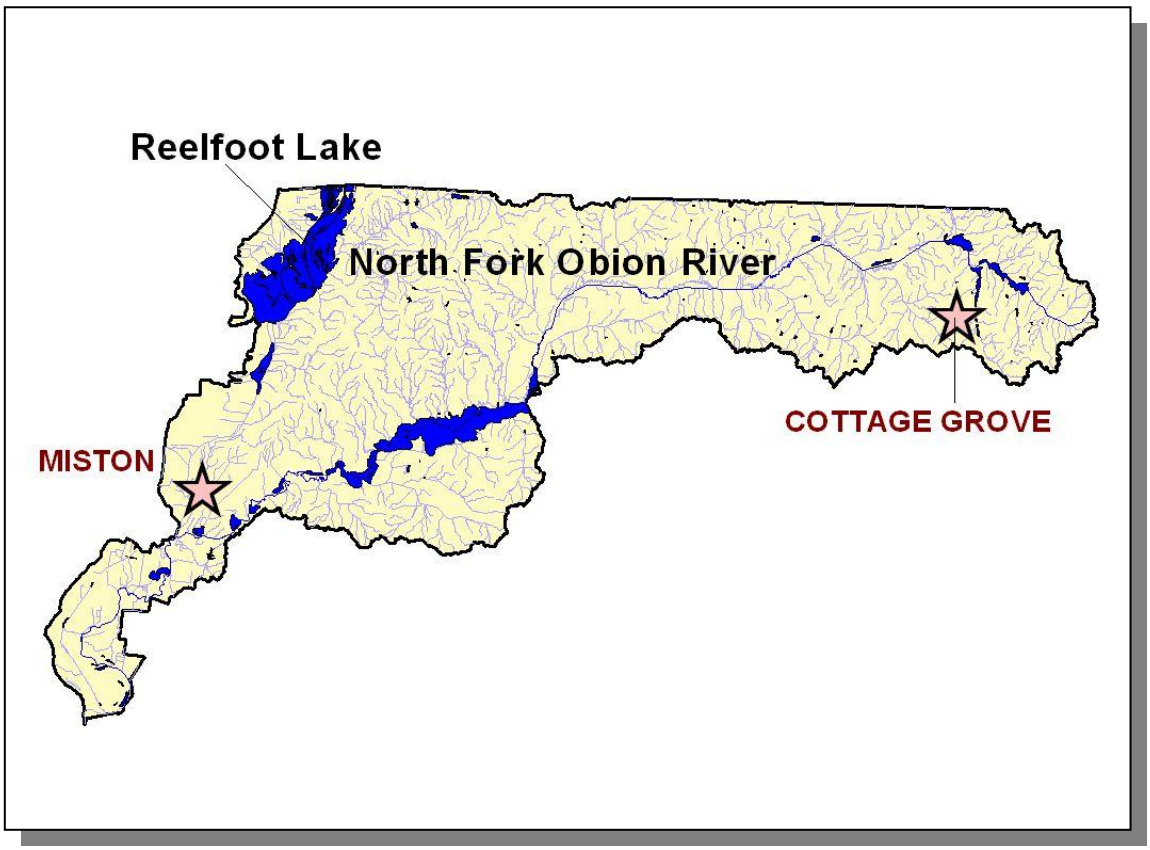

Figure 2-4. Hydrology in the Tennessee Portion of the Obion River (North Fork) Watershed. *There are 1,741.1 stream miles and 15,500 lake acres recorded in River Reach File 3 in the Tennessee Portion of the Obion River (North Fork) Watershed. Location of the North Fork Obion River and Reelfoot Lake, and the cities of Cottage Grove and Miston are shown for reference.*

2.3.B. Dams. There are 57 dams inventoried by TDEC Division of Water Supply in the Tennessee portion of the Obion River (North Fork) Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

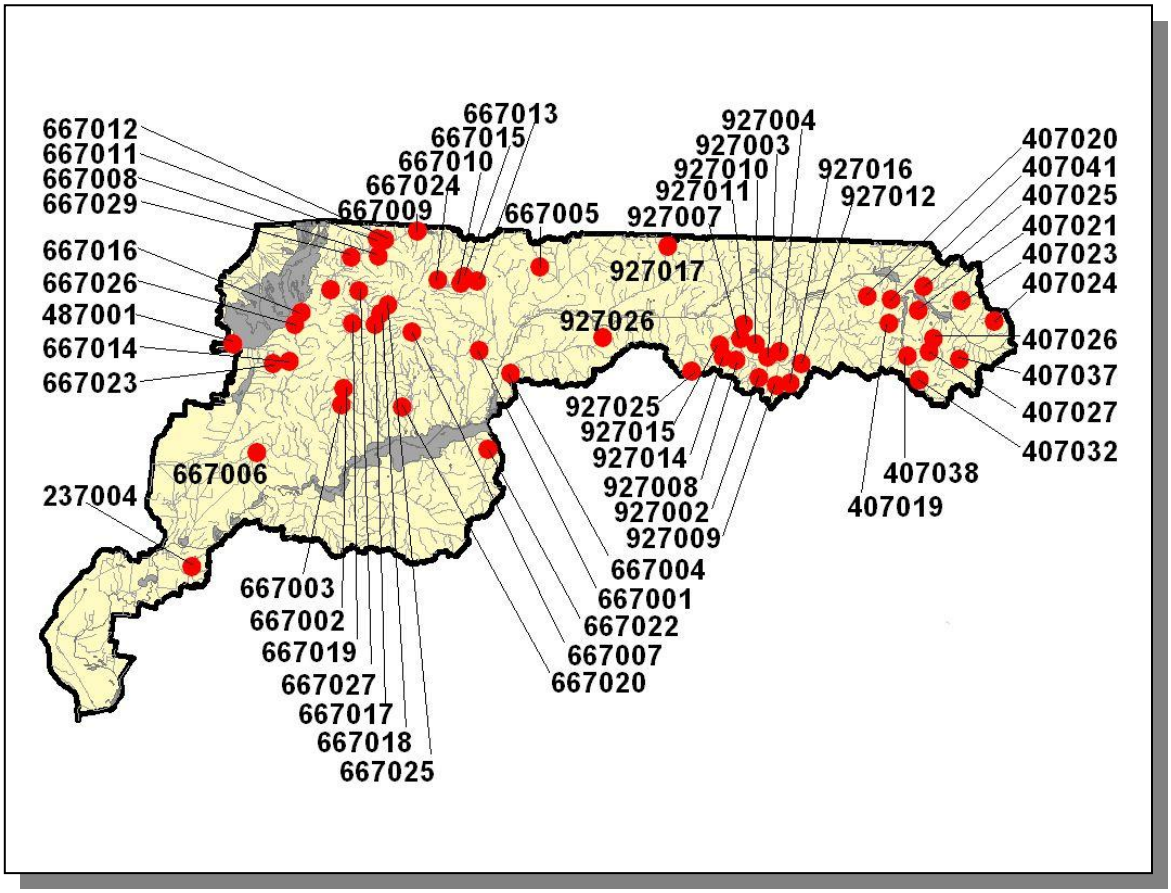

Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Obion River (North Fork) Lake Watershed. *More information, including identification of inventoried dams labeled, is provided in Appendix II and at http://gwidc.memphis.edu/website/dams/viewer.htm.*

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 2001 Multi-Resolution Land Cover (MRLC) satellite imagery.

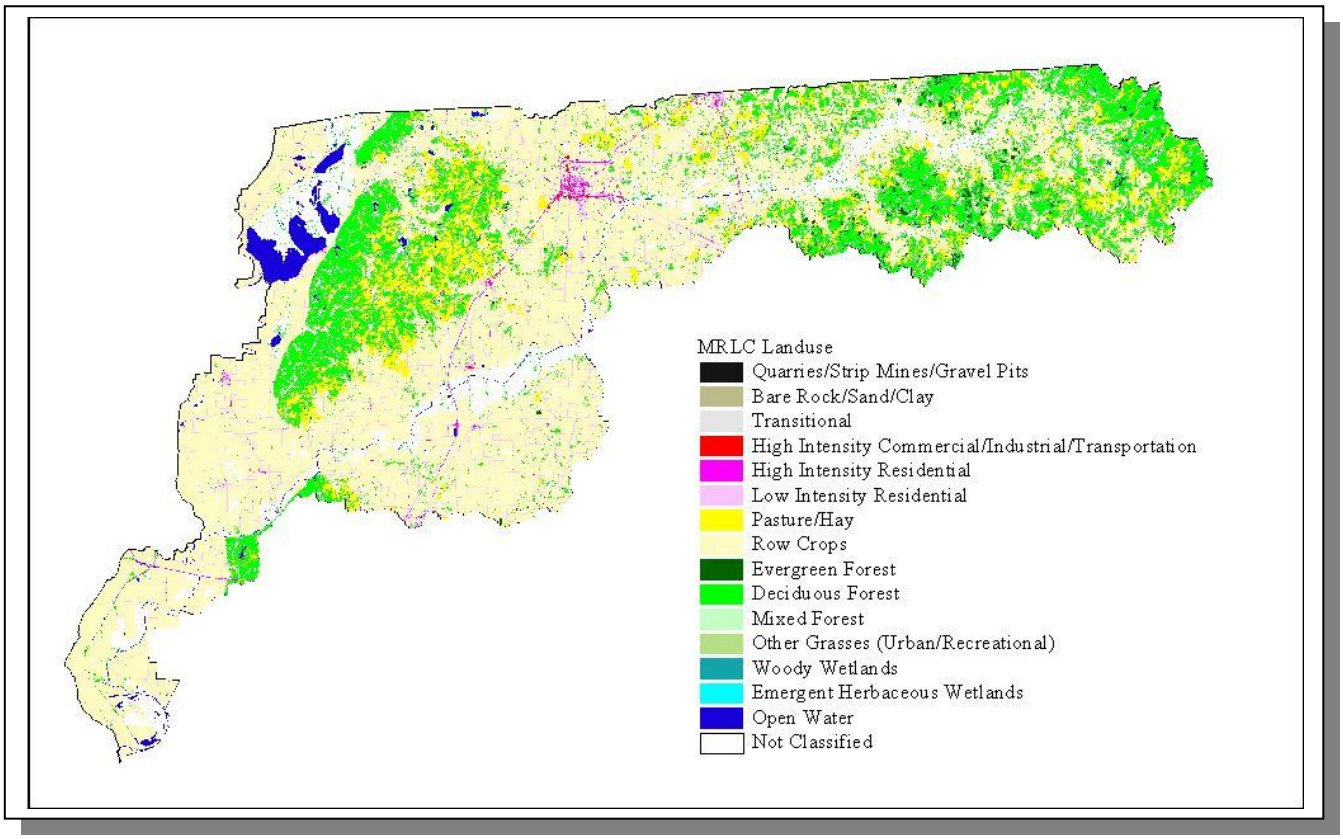

Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

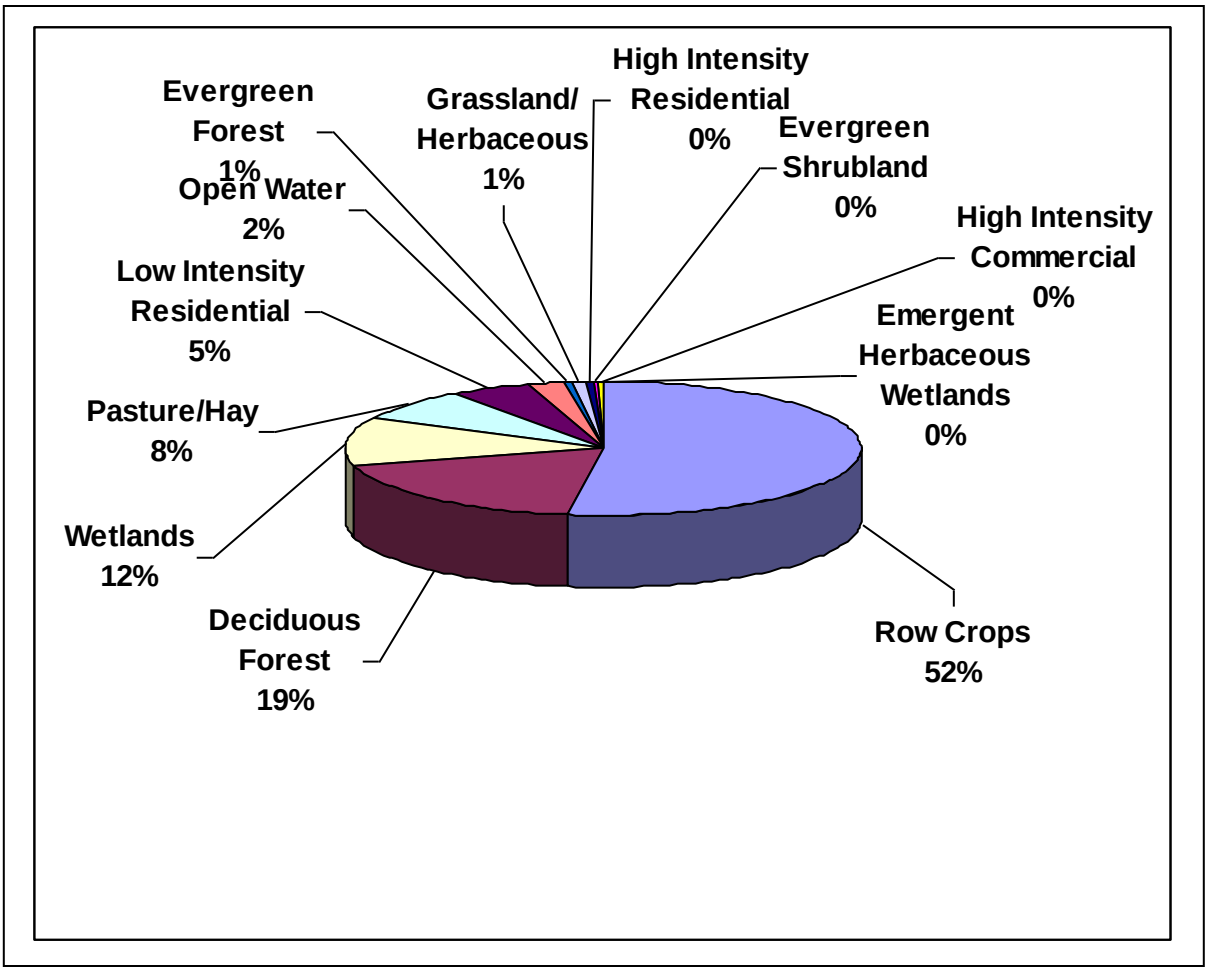

Figure 2-7. Land Use Distribution in the Tennessee Portion of the Obion River (North Fork) Watershed. *More information is provided in Appendix II.*

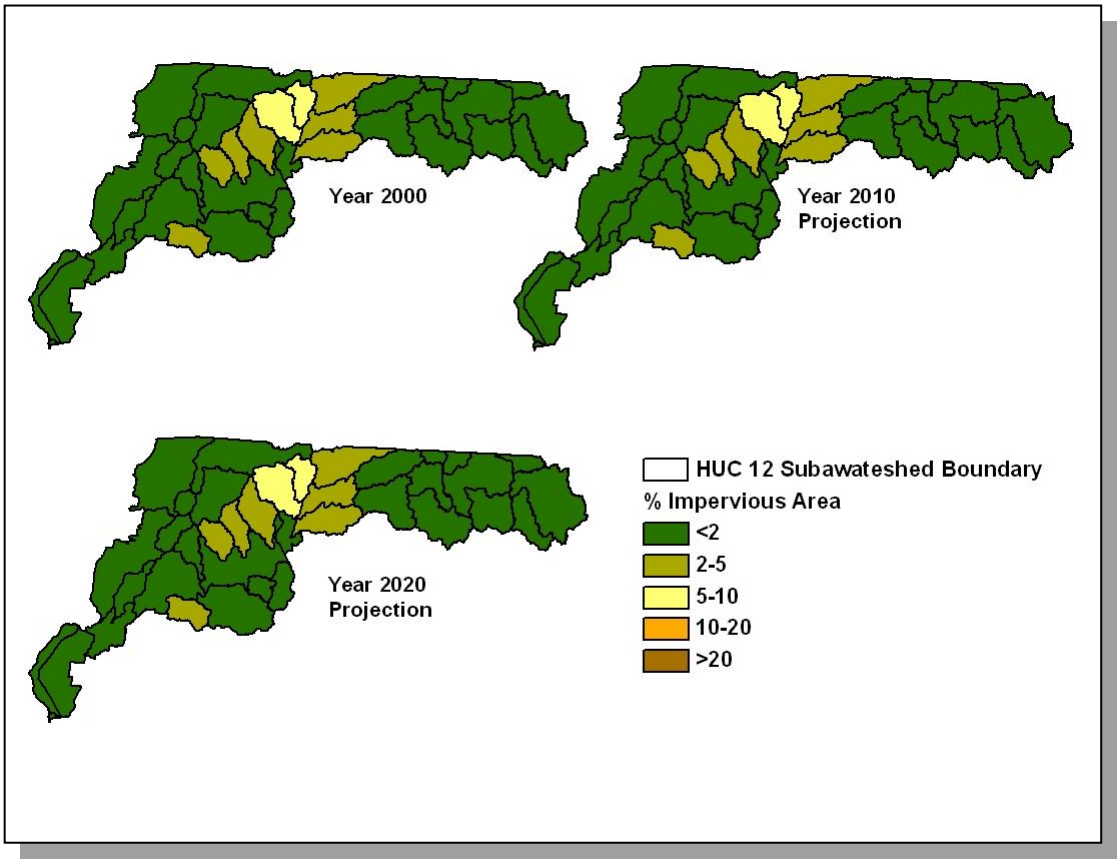

Figure 2-8. Illustration of Total Impervious Area in the Tennessee Portion of the Obion River (North Fork) Watershed. *All HUC-12 subwatersheds are shown. Current estimates and projected total impervious cover calculated by HUC-12 are provided by EPA Region 4. More information can be found at: http://www.epa.gov/ATHENS/research/impervious/.*

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Obion (North Fork) River Watershed lies within 3 Level III ecoregions (Southeastern Plains, Mississippi Alluvial Plain, and Mississippi Valley Loess Plains) and contains 4 Level IV subecoregions:

- The **Southeastern Plains and Hills (65e)** contain several north-south trending bands of sand and clay formations. Tertiary-age sand, clay, and lignite are to the west, and Cretaceous-age fine sand, fossiliferous micaceous sand, and silty clays are to the east. With elevations reaching over 650 feet, and more rolling topography and more relief than the Loess Plains (74b) to the west, streams have increased gradient, generally sandy substrates, and distinctive faunal characteristics for west Tennessee. The natural vegetation type is oak-hickory forest, grading into oak-hickory-pine to the south.

- The **Northern Mississippi Alluvial Plain (73a)** within Tennessee is a relatively flat region of Quaternary alluvial deposits of sand, silt, clay, and gravel. It is bounded distinctly on the east by the Bluff Hills (74a), and on the west by the Mississippi River. Average elevations are 200-300 feet with little relief. Most of the region is in cropland, with some areas of deciduous forest. Soybeans, cotton, corn, sorghum, and vegetables are the main crops. The natural vegetation consists of Southern floodplain forest (oak, tupelo, bald cypress). The two main distinctions in the Tennessee portion of the ecoregion are between areas of loamy, silty, and sandy soils with better drainage, and areas of more clayey soils of poor drainage that may contain wooded swamp-land and oxbow lakes. Waterfowl, raptors, and migratory songbirds are relatively abundant in the region.

- The **Bluff Hills (74a)** consist of sand, clay, silt, and lignite, and are capped by loess greater than 60 feet deep. The disjunct region in Tennessee encompasses those thick loess areas that are generally the steepest, most dissected, and forested. The carved loess has a mosaic of microenvironments, including dry slopes and ridges, moist slopes, ravines, bottomland areas, and small cypress swamps. While oak-hickory is the general forest type, some of the undisturbed bluff vegetation is rich in mesophytes, such as beech and sugar maple, with similarities to hardwood forests of eastern Tennessee. Smaller streams of the Bluff Hills have localized reaches of increased gradient and small areas of gravel substrate that create aquatic habitats that are distinct from those of the Loess Plains (74b) to the east. Unique, isolated fish assemblages more typical of upland habitats can be found in these stream reaches. Gravels are also exposed in places at the base of the bluffs.

- The **Loess Plains (74b)** are gently rolling, irregular plains, 250-500 feet in elevation, with loess up to 50 feet thick. The region is a productive agricultural area of soybeans, cotton, corn, milo, and sorghum crops, along with livestock and poultry. Soil erosion can be a problem on the steeper, upland Alfisol soils; bottom soils are mostly silty Entisols. Oak-hickory and southern floodplain forests are the natural vegetation types, although most of the forest cover has been removed for cropland. Some less-disturbed bottomland forest and cypress-gum swamp habitats still remain. Several large river systems with wide floodplains, the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf, cross the region. Streams are low-gradient and murky with silt and sand bottoms, and most have been channelized.

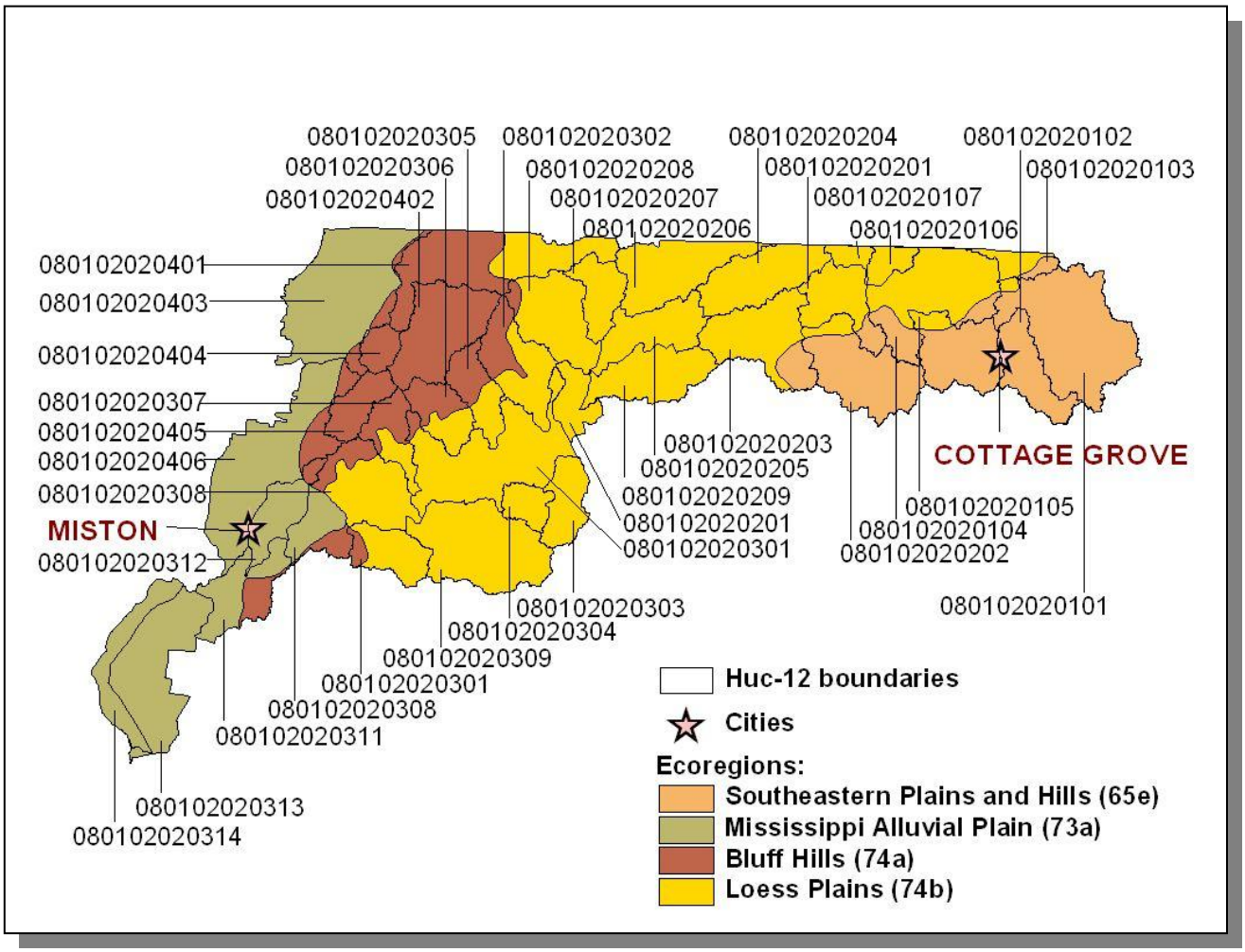

Figure 2-9. Level IV Ecoregions in the Tennessee Portion of the Obion (North Fork) River Watershed. *HUC-12 subwatershed boundaries and locations of Miston and Cottage Grove are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition within that ecoregion and may not be representative of a pristine condition.

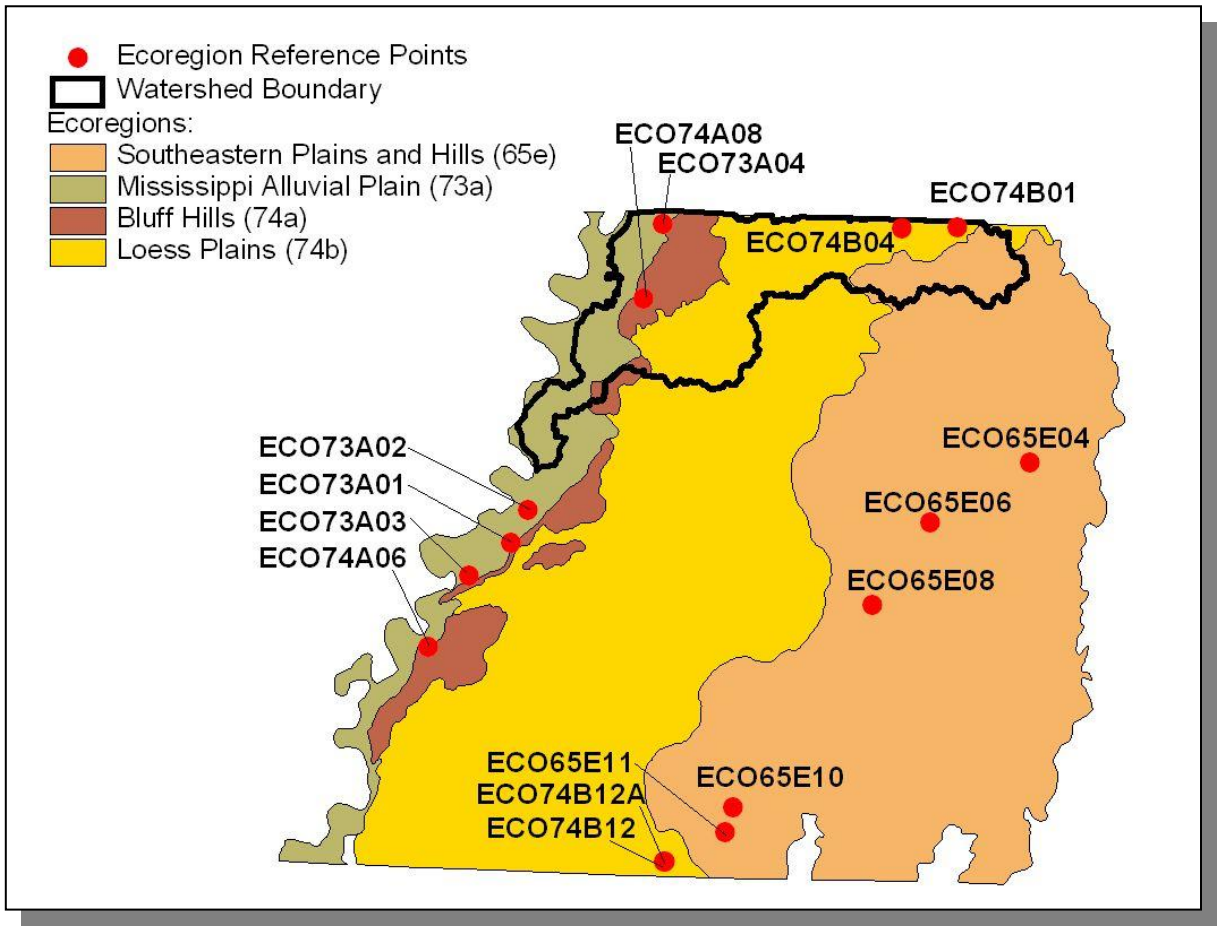

Figure 2-10. Ecoregion Monitoring Sites in Level IV Ecoregions 65e, 73a, 74a, 74b. *The Tennessee Portion of the Obion River (North Fork) Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 01/01/2006, is provided in Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Area. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. TDEC/Division of Natural Areas administers the State Natural Areas program. Further information may be found at http://www.state.tn.us/environment/na/.

The Obion River (North Fork) Watershed has one Designated State Natural Area:

> **Reelfoot Lake** is an 18,000-acre natural area located in Lake and Obion Counties in northwest Tennessee. Reelfoot Lake was created by a series of violent New Madrid fault zone earthquakes in the winter of 1811-1812. The lake and surrounding forests attract a large diversity of wintering and breeding populations of waterfowl, and boasts of a significant population of wintering bald eagles. Reelfoot is also recognized by the United States Department of Interior as a National Natural Landmark. It is one of only fourteen National Natural Landmarks in Tennessee. These landmarks are recognized as the country's best remaining examples of major biotic communities and geologic features.

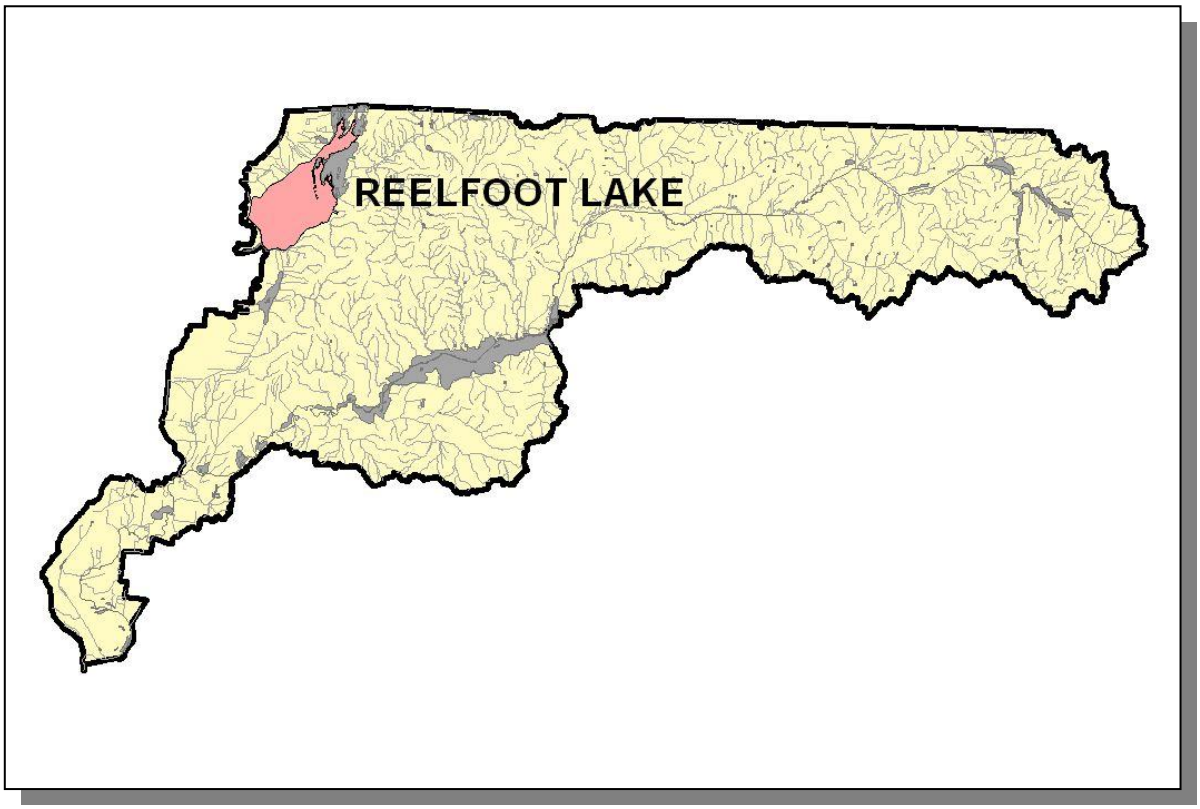

Figure 2-11. There is One Designated State Natural Area in the Tennessee Portion of the Obion River (North Fork) Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Areas maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Snails	1
Birds	13
Fish	5
Mammals	5
Reptiles	1
Plants	20
Total	**45**

Table 2-3. There are 44 Known Rare Plant and Animal Species in the Tennessee Portion of the Obion River (North Fork) Watershed.

In the Tennessee Portion of the Obion River (North Fork) Watershed, there are five known rare fish species, one known rare snail species, and one known rare reptile species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Scaphirhynchus albus	Pallid Sturgeon	LE	E
Etheostoma pyrrhogaster	Firebelly Darter		D
Fundulus chrysotus	Golden Topminnow		D
Lepisosteus spatula	Alligator Gar		D
Noturus stigmosus	Northern Madtom		D
Macroclemys temminckii	Alligator Snapping Turtle		D
Triodopsis multilineata	Striped Whitelip		

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Obion River (North Fork) River Watershed. *Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service. State Status: LT, Listed Threatened by the Tennessee Wildlife Resources Agency; E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at http://www.state.tn.us/environment/na/.*

2.6.C. Wetlands. The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

http://www.state.tn.us/environment/na/wetlands/

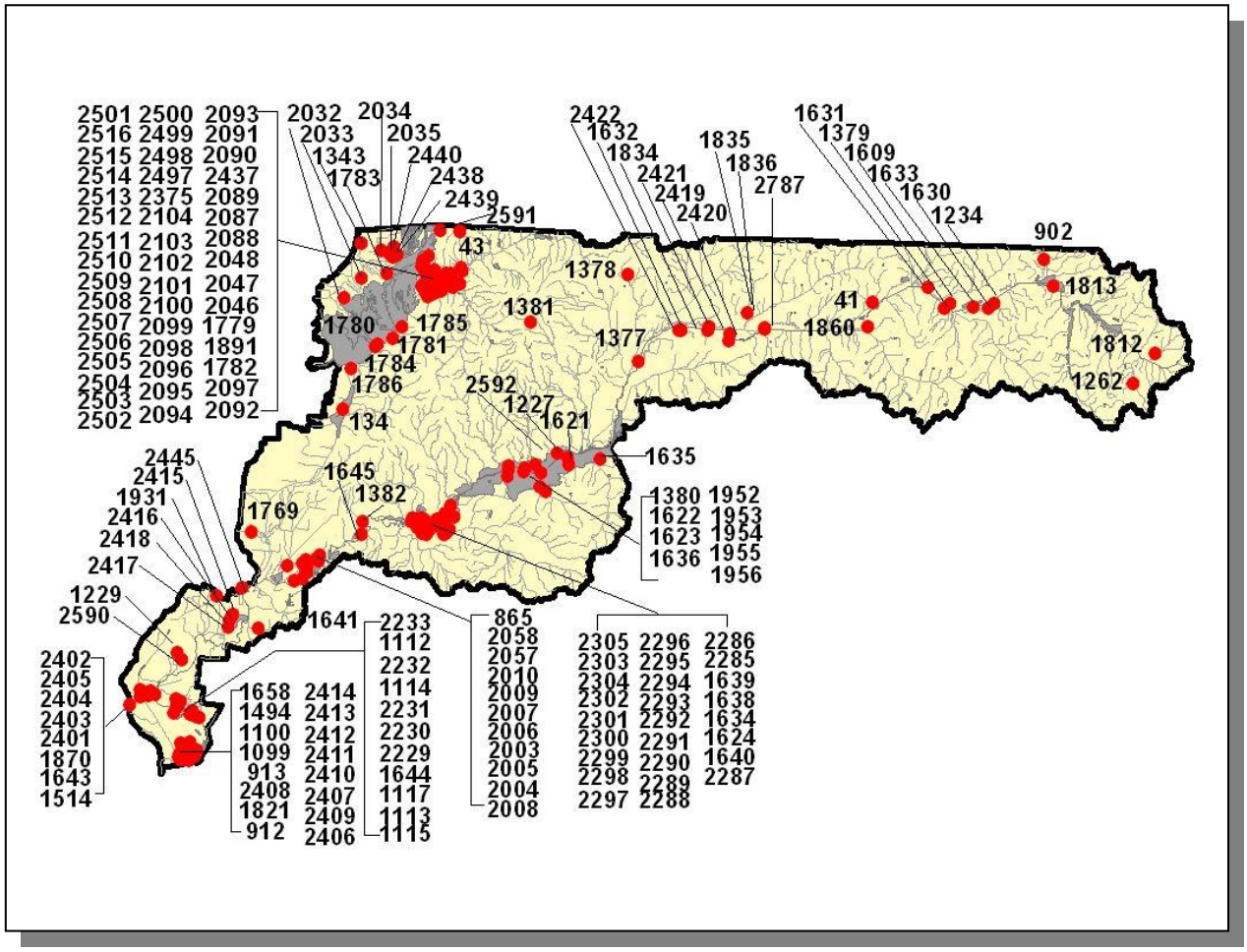

Figure 2-12. Location of Wetland Sites in TDEC Division of Natural Areas Database in Tennessee Portion of the Obion River (North Fork) Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. *There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists a portion of one river in the Obion River (North Fork) Watershed:

Obion River (RM 0 to RM 59) is a pastoral stream with variety of flora and fauna.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Obion River	X	X		X	X		

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at http://www.ncrc.nps.gov/rtca/nri/

2.7.C. Public Lands. Some sites representative of the cultural heritage in the Tennessee portion of the Nolichucky River Watershed are under state or federal protection:

- Bogota WMA is a 2,373-acre parcel of land managed by the Tennessee Wildlife Resources Agency (TWRA). More information may be found at: http://www.state.tn.us/twra/gis/wmapdf/Bogota.pdf
- Ernest Rice WMA is a 2,123-acre tract of land managed by TWRA. More information may be found at: http://www.state.tn.us/twra/gis/wmapdf/ErnestRice.pdf
- George L. Yarbro WMA is managed by TWRA.
- Gooch WMA comprise two tracts of land totaling 8,620 acres and are managed by TWRA. More information may be found at: http://www.state.tn.us/twra/gis/wmapdf/Gooch.pdf
- Lake Isom National Wildlife Refuge is a 1,850-acre refuge located in Obion County and managed by the U.S. Fish and Wildlife Service. More information may be found at: http://www.fws.gov/reelfoot/isom.html

- Moss Island WMA is a 3,359-acre tract of land managed by TWRA. More information may be found at:
  http://www.state.tn.us/twra/gis/wmapdf/MossIsland.pdf

- Reelfoot Lake WMA and Black Bayou Wildlife Refuge comprise 1,050 acres and is managed by the TWRA. More information may be found at: http://www.state.tn.us/twra/gis/wmapdf/Reelfoot.pdf

- Reelfoot National Wildlife Refuge is a 10,428-acre refuge located in Obion County and managed by the U.S. Fish and Wildlife Service. More information may be found at:
  http://www.fws.gov/southeast/pubs/facts/rlfpdf.pdf

- Soil Conservation lakes are managed by the TWRA and used to reduce the rate of sedimentation into Reelfoot Lake. More information may be found at: http://www.epa.gov/owow/info/NewsNotes/issue04/nps04agr.html

- Whites Lake refuge consists of 615 acres of land managed by TWRA and Ducks Unlimited, Inc. More information may be found at: http://www.ducks.org/Tennessee/TennesseeProjects/1582/WhiteLakeRefugeWetlandsRestoration.html

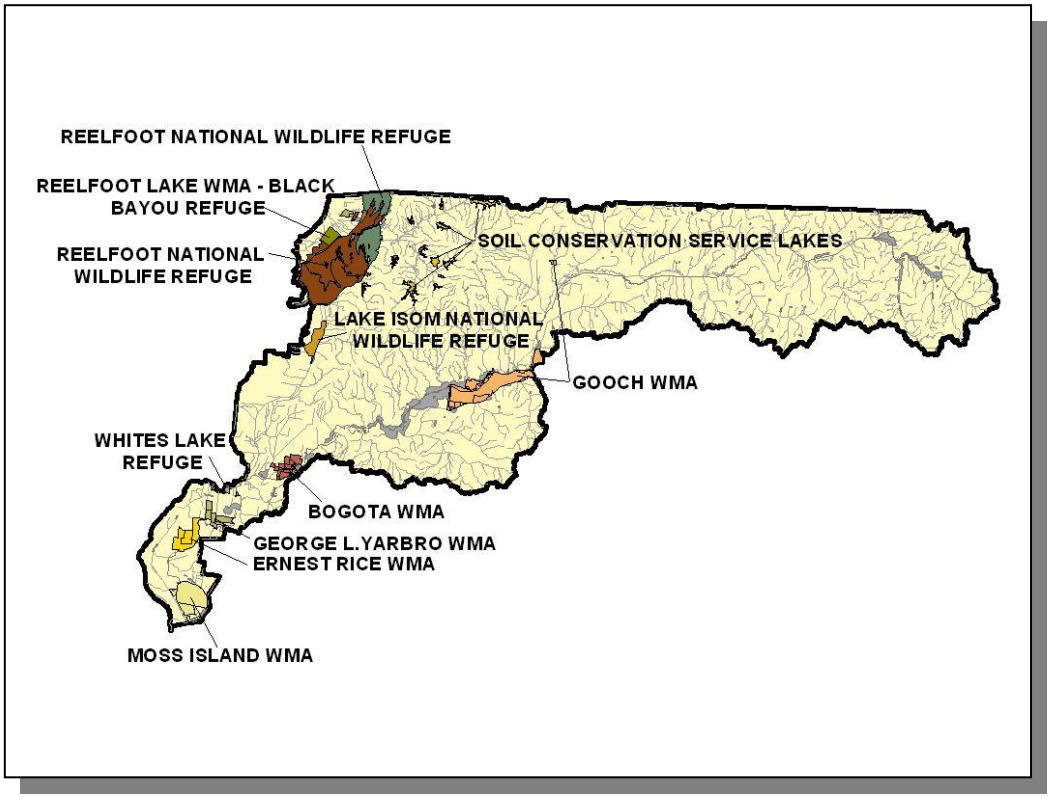

Figure 2-13. Public Lands in the Obion River (North Fork) Watershed. *Data are from Tennessee Wildlife Resources Agency. WMA, Wildlife Management Area.*

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/publications/riv/

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Bayou Du Chien	2			North Reelfoot Creek	4		3
Biffle Creek	4			Obion River	4	2,3	
Big Ronaldson Slough	1			Obion River Drainage Canal	4	3	
Blackamore Creek	4		4	PawPaw Creek			
Burnt Mill Hollow Creek	3			Powell Creek	4		3
Cane Creek	4			Pursley Creek			
Clear Creek	4			Reeds Creek	4		
Clover Creek	4		2	Reelfoot Creek	3		
Cool Springs Branch Reeds Creek	3			Richland Creek	4		4
Cypress Creek North	3		2	Running Reelfoot Bayou	4	3	
Cypress Creek South	4		4	Running Reelfoot Ditch	4		
Davidson Creek	4		2	South Reelfoot Creek	4		
Grass Creek	4			Spring Hill Creek	4		
Harris Fork Creek	4			Terrapin Creek	3		
Hoosier Creek	3			Troy Creek	4		
Hurricane Creek	4		3	Walnut Fork North Fork Obion River	3		
Mill creek	3,4			Zion Creek	3		
North Fork Obion River	2,3,4	3					

Table 2-6. Tennessee Rivers Assessment Project Stream Scoring in the North Fork Obion River Watershed.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed